

Practitioner's Docket No. 313-011-1**PATENT**

Preliminary Classification:

Proposed Class:

Subclass:

NOTE: "All applicants are requested to include a preliminary classification on newly filed patent applications. The preliminary classification, preferably class and subclass designations, should be identified in the upper right-hand corner of the letter of transmittal accompanying the application papers, for example 'Proposed Class 2, subclass 129.'" M.P.E.P. § 601, 7th ed.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Box Patent Application
Assistant Commissioner for Patents
Washington, D.C. 20231

NEW APPLICATION TRANSMITTAL

Transmitted herewith for filing is the patent application of

Inventor(s): Francis J. Maguire, Jr.**WARNING:** 37 C.F.R. § 1.41(a)(1) points out:

"(a) A patent is applied for in the name or names of the actual inventor or inventors.

"(1) The inventorship of a nonprovisional application is that inventorship set forth in the oath or declaration as prescribed by § 1.63, except as provided for in § 1.53(d)(4) and § 1.63(d). If an oath or declaration as prescribed by § 1.63 is not filed during the pendency of a nonprovisional application, the inventorship is that inventorship set forth in the application papers filed pursuant to § 1.53(b), unless a petition under this paragraph accompanied by the fee set forth in § 1.17(i) is filed supplying or changing the name or names of the inventor or inventors."

For (title):

Moveable Headrest for Viewing Images from Different Directions**CERTIFICATION UNDER 37 C.F.R. § 1.10*****(Express Mail label number is mandatory.)****(Express Mail certification is optional.)**

I hereby certify that this New Application Transmittal and the documents referred to as attached therein are being deposited with the United States Postal Service on this date March 13, 2000 in an envelope as "Express Mail Post Office to Addressee," mailing Label Number EL 381226795 US, addressed to the: Assistant Commissioner for Patents, Washington, D.C. 20231.

Judith Schick

(type or print name of person mailing paper)

Judith Schick

Signature of person mailing paper

WARNING: Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. § 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.

***WARNING:** Each paper or fee filed by "Express Mail" **must** have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. § 1.10(b).

"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.

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03/13/00
jc781 U.S. PTO

jc511 U.S. PTO
09/524491
03/13/00

03/13/00
jc781 U.S. PTO

1. Type of Application

This new application is for a(n)

(check one applicable item below)

- ☒ Original (nonprovisional)
☐ Design
☐ Plant

WARNING: Do not use this transmittal for a completion in the U.S. of an International Application under 35 U.S.C. § 371(c)(4), unless the International Application is being filed as a divisional, continuation or continuation-in-part application.

WARNING: Do not use this transmittal for the filing of a provisional application.

NOTE: If one of the following 3 items apply, then complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF A PRIOR U.S. APPLICATION CLAIMED and a NOTIFICATION IN PARENT APPLICATION OF THE FILING OF THIS CONTINUATION APPLICATION.

- ☐ Divisional.
☐ Continuation.
☐ Continuation-in-part (C-I-P).

2. Benefit of Prior U.S. Application(s) (35 U.S.C. §§ 119(e), 120, or 121)

NOTE: A nonprovisional application may claim an invention disclosed in one or more prior filed copending nonprovisional applications or copending international applications designating the United States of America. In order for a nonprovisional application to claim the benefit of a prior filed copending nonprovisional application or copending international application designating the United States of America, each prior application must name as an inventor at least one inventor named in the later filed nonprovisional application and disclose the named inventor's invention claimed in at least one claim of the later filed nonprovisional application in the manner provided by the first paragraph of 35 U.S.C. § 112. Each prior application must also be:

(i) An international application entitled to a filing date in accordance with PCT Article 11 and designating the United States of America; or

(ii) Complete as set forth in § 1.51(b); or

(iii) Entitled to a filing date as set forth in § 1.53(b) or § 1.53(d) and include the basic filing fee set forth in § 1.16; or

(iv) Entitled to a filing date as set forth in § 1.53(b) and have paid therein the processing and retention fee set forth in § 1.21(f) within the time period set forth in § 1.53(f).

37 C.F.R. § 1.78(a)(1).

NOTE: If the new application being transmitted is a divisional, continuation or a continuation-in-part of a parent case, or where the parent case is an International Application which designated the U.S., or benefit of a prior provisional application is claimed, then check the following item and complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

WARNING: If an application claims the benefit of the filing date of an earlier filed application under 35 U.S.C. §§ 120, 121 or 365(c), the 20-year term of that application will be based upon the filing date of the earliest U.S. application that the application makes reference to under 35 U.S.C. §§ 120, 121 or 365(c). (35 U.S.C. § 154(a)(2) does not take into account, for the determination of the patent term, any application on which priority is claimed under 35 U.S.C. §§ 119, 365(a) or 365(b).) For a c-i-p application, applicant should review whether any claim in the patent that will issue is supported by an earlier application and, if not, the applicant should consider canceling the reference to the earlier filed application. The term of a patent is not based on a claim-by-claim approach. See Notice of April 14, 1995, 60 Fed. Reg. 20,195, at 20,205.

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WARNING: When the last day of pendency of a provisional application falls on a Saturday, Sunday, or Federal holiday within the District of Columbia, any nonprovisional application claiming benefit of the provisional application **must** be filed prior to the Saturday, Sunday, or Federal holiday within the District of Columbia. See 37 C.F.R. § 1.78(a)(3).

- ☒ The new application being transmitted claims the benefit of prior U.S. application(s). Enclosed are ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

3. Papers Enclosed

A. Required for filing date under 37 C.F.R. § 1.53(b) (Regular) or 37 C.F.R. § 1.153 (Design) Application

12 Pages of specification

2 Pages of claims

5 Sheets of drawing

WARNING: DO NOT submit original drawings. A high quality copy of the drawings should be supplied when filing a patent application. The drawings that are submitted to the Office must be on strong, white, smooth, and non-shiny paper and meet the standards according to § 1.84. If corrections to the drawings are necessary, they should be made to the original drawing and a high-quality copy of the corrected original drawing then submitted to the Office. Only one copy is required or desired. For comments on proposed then-new 37 C.F.R. § 1.84, see Notice of March 9, 1988 (1990 O.G. 57-62).

NOTE: "Identifying indicia, if provided, should include the application number or the title of the invention, inventor's name, docket number (if any), and the name and telephone number of a person to call if the Office is unable to match the drawings to the proper application. This information should be placed on the back of each sheet of drawing a minimum distance of 1.5 cm. (5/8 inch) down from the top of the page . . ." 37 C.F.R. § 1.84(c)).

(complete the following, if applicable)

- ☐ The enclosed drawing(s) are photograph(s), and there is also attached a "PETITION TO ACCEPT PHOTOGRAPH(S) AS DRAWING(S)." 37 C.F.R. § 1.84(b).

☐ formal

☐ informal

B. Other Papers Enclosed

2 Pages of declaration and power of attorney

1 Pages of abstract

____ Other

4. Additional papers enclosed

☐ Amendment to claims

- ☐ Cancel in this applications claims _____ before calculating the filing fee. (At least one original independent claim must be retained for filing purposes.)

☐ Add the claims shown on the attached amendment. (Claims added have been numbered consecutively following the highest numbered original claims.)

☐ Preliminary Amendment

☐ Information Disclosure Statement (37 C.F.R. § 1.98)

☐ Form PTO-1449 (PTO/SB/08A and 08B)

☐ Citations

- ☐ Declaration of Biological Deposit
- ☐ Submission of "Sequence Listing," computer readable copy and/or amendment pertaining thereto for biotechnology invention containing nucleotide and/or amino acid sequence.
- ☐ Authorization of Attorney(s) to Accept and Follow Instructions from Representative
- ☐ Special Comments
- ☐ Other

5. Declaration or oath (including power of attorney)

NOTE: A newly executed declaration is not required in a continuation or divisional application provided that the prior nonprovisional application contained a declaration as required, the application being filed is by all or fewer than all the inventors named in the prior application, there is no new matter in the application being filed, and a copy of the executed declaration filed in the prior application (showing the signature or an indication thereon that it was signed) is submitted. The copy must be accompanied by a statement requesting deletion of the names of person(s) who are not inventors of the application being filed. If the declaration in the prior application was filed under § 1.47, then a copy of that declaration must be filed accompanied by a copy of the decision granting § 1.47 status or, if a nonsigning person under § 1.47 has subsequently joined in a prior application, then a copy of the subsequently executed declaration must be filed. See 37 C.F.R. §§ 1.63(d)(1)–(3).

NOTE: A declaration filed to complete an application must be executed, identify the specification to which it is directed, identify each inventor by full name including family name and at least one given name, without abbreviation together with any other given name or initial, and the residence, post office address and country or citizenship of each inventor, and state whether the inventor is a sole or joint inventor. 37 C.F.R. § 1.63(a)(1)–(4).

NOTE: "The inventorship of a nonprovisional application is that inventorship set forth in the oath or declaration as prescribed by § 1.62, except as provided for in § 1.53(d)(4) and § 1.63(d). If an oath or declaration as prescribed by § 1.63 is not filed during the pendency of a nonprovisional application, the inventorship is that inventorship set forth in the application papers filed pursuant to § 1.53(b), unless a petition under this paragraph accompanied by the fee set forth in § 1.17(f) is filed supplying or changing the name or names of the inventor or inventors." 37 C.F.R. § 1.41(a)(1).

☒ Enclosed

Executed by

(check all applicable boxes)

☒ inventor(s).

☐ legal representative of inventor(s).
37 C.F.R. §§ 1.42 or 1.43.

☐ joint inventor or person showing a proprietary interest on behalf of inventor who refused to sign or cannot be reached.

☐ This is the petition required by 37 C.F.R. § 1.47 and the statement required by 37 C.F.R. § 1.47 is also attached. See item 13 below for fee.

☐ Not Enclosed.

NOTE: Where the filing is a completion in the U.S. of an International Application or where the completion of the U.S. application contains subject matter in addition to the International Application, the application may be treated as a continuation or continuation-in-part, as the case may be, utilizing ADDED PAGE FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION CLAIMED.

☐ Application is made by a person authorized under 37 C.F.R. § 1.41(c) on behalf of all the above named inventor(s).

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(The declaration or oath, along with the surcharge required by 37 C.F.R. § 1.16(e) can be filed subsequently).

- ☐ Showing that the filing is authorized.
(not required unless called into question. 37 C.F.R. § 1.41(d))

6. Inventorship Statement

WARNING: If the named inventors are each not the inventors of all the claims an explanation, including the ownership of the various claims at the time the last claimed invention was made, should be submitted.

The inventorship for all the claims in this application are:

- ☒ The same.

or

- ☐ Not the same. An explanation, including the ownership of the various claims at the time the last claimed invention was made,
☐ is submitted.
☐ will be submitted.

7. Language

NOTE: An application including a signed oath or declaration may be filed in a language other than English. An English translation of the non-English language application and the processing fee of \$130.00 required by 37 C.F.R. § 1.17(k) is required to be filed with the application, or within such time as may be set by the Office. 37 C.F.R. § 1.52(d).

- ☒ English
☐ Non-English
☐ The attached translation includes a statement that the translation is accurate. 37 C.F.R. § 1.52(d).

8. Assignment

- ☐ An assignment of the invention to _____

☐ is attached. A separate ☐ "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or ☐ FORM PTO 1595 is also attached.
☐ will follow.

NOTE: "If an assignment is submitted with a new application, send two separate letters—one for the application and one for the assignment." Notice of May 4, 1990 (1114 O.G. 77-78).

WARNING: A newly executed "CERTIFICATE UNDER 37 C.F.R. § 3.73(b)" must be filed when a continuation-in-part application is filed by an assignee. Notice of April 30, 1993, 1150 O.G. 62-64.

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9. Certified Copy

Certified copy(ies) of application(s)

Country	Appln. No.	Filed
Country	Appln. No.	Filed
Country	Appln. No.	Filed

from which priority is claimed

☐ is (are) attached.☐ will follow.

NOTE: The foreign application forming the basis for the claim for priority must be referred to in the oath or declaration. 37 C.F.R. § 1.55(a) and 1.63.

NOTE: This item is for any foreign priority for which the application being filed directly relates. If any parent U.S. application or International Application from which this application claims benefit under 35 U.S.C. § 120 is itself entitled to priority from a prior foreign application, then complete item 18 on the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

10. Fee Calculation (37 C.F.R. § 1.16)**A.** ☐ Regular application

CLAIMS AS FILED			
Number filed	Number Extra	Rate	Basic Fee 37 C.F.R. § 1.16(a) \$690.00
Total			
Claims (37 C.F.R. § 1.16(c))	7 - 20 = -0-	× \$ 18.00	—
Independent			
Claims (37 C.F.R. § 1.16(b))	3 - 3 = -0-	× \$ 78.00	—
Multiple dependent claim(s), if any (37 C.F.R. § 1.16(d))		+ \$260.00	

☐ Amendment cancelling extra claims is enclosed.☐ Amendment deleting multiple-dependencies is enclosed.☐ Fee for extra claims is not being paid at this time.

NOTE: If the fees for extra claims are not paid on filing they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Patent and Trademark Office in any notice of fee deficiency. 37 C.F.R. § 1.16(d).

Filing Fee Calculation

\$ 690.00**B.** ☐ Design application

(\$310.00—37 C.F.R. § 1.16(f))

Filing Fee Calculation

\$ _____

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- C. ☐ Plant application
(\$480.00—37 C.F.R. § 1.16(g))

Filing fee calculation

\$ _____

11. Small Entity Statement(s)

- ☒ Statement(s) that this is a filing by a small entity under 37 C.F.R. § 1.9 and 1.27 is (are) attached.

WARNING: "Status as a small entity must be specifically established in each application or patent in which the status is available and desired. Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established. The refiling of an application under § 1.53 as a continuation, division, or continuation-in-part (including a continued prosecution application under § 1.53(d)), or the filing of a reissue application requires a new determination as to continued entitlement to small entity status for the continuing or reissue application. A nonprovisional application claiming benefit under 35 U.S.C. § 119(e), 120, 121, or 365(c) of a prior application, or a reissue application may rely on a statement filed in the prior application or in the patent if the nonprovisional application or the reissue application includes a reference to the statement in the prior application or in the patent and status as a small entity is still proper and desired. The payment of the small entity basic statutory filing fee will be treated as such a reference for purposes of this section." 37 C.F.R. § 1.28(a)(2).

WARNING: "Small entity status must not be established when the person or persons signing the . . . statement can **unequivocally** make the required self-certification." M.P.E.P., § 509.03, 6th ed., rev. 2, July 1996 (emphasis added).

(complete the following, if applicable)

- ☐ Status as a small entity was claimed in prior application
_____ / _____, filed on _____, from which benefit is being claimed for this application under:

35 U.S.C. § ☐ 119(e),
☐ 120,
☐ 121,
☐ 365(c),

and which status as a small entity is still proper and desired.

- ☐ A copy of the statement in the prior application is included.

Filing Fee Calculation (50% of A, B or C above)

\$ 345.00

NOTE: Any excess of the full fee paid will be refunded if small entity status is established and a refund request are filed within 2 months of the date of timely payment of a full fee. The two-month period is not extendable under § 1.136. 37 C.F.R. § 1.28(a).

12. Request for International-Type Search (37 C.F.R. § 1.104(d))

(complete, if applicable)

- ☐ Please prepare an international-type search report for this application at the time when national examination on the merits takes place.

13. Fee Payment Being Made at This Time

☐ Not Enclosed

☐ No filing fee is to be paid at this time.

(This and the surcharge required by 37 C.F.R. § 1.16(e) can be paid subsequently.)

☐ Enclosed

☒ Filing fee

\$ 345.00

☐ Recording assignment

(\$40.00; 37 C.F.R. § 1.21(h))

(See attached "COVER SHEET FOR
ASSIGNMENT ACCOMPANYING NEW
APPLICATION".)

\$ _____

☐ Petition fee for filing by other than all the
inventors or person on behalf of the inventor
where inventor refused to sign or cannot be
reached

(\$130.00; 37 C.F.R. §§ 1.47 and 1.17(i))

\$ _____

☐ For processing an application with a
specification in

a non-English language

(\$130.00; 37 C.F.R. §§ 1.52(d) and 1.17(k))

\$ _____

☐ Processing and retention fee

(\$130.00; 37 C.F.R. §§ 1.53(d) and 1.21(l))

\$ _____

☐ Fee for international-type search report

(\$40.00; 37 C.F.R. § 1.21(e))

\$ _____

NOTE: 37 C.F.R. § 1.21(f) establishes a fee for processing and retaining any application that is abandoned for failing to complete the application pursuant to 37 C.F.R. § 1.53(f) and this, as well as the changes to 37 C.F.R. §§ 1.53 and 1.78(a)(1), indicate that in order to obtain the benefit of a prior U.S. application, either the basic filing fee must be paid, or the processing and retention fee of § 1.21(f) must be paid, within 1 year from notification under § 53(f).

Total fees enclosed

\$ 345.00

14. Method of Payment of Fees

☒ Check in the amount of \$ 345.00

☐ Charge Account No. _____ in the amount of
\$ _____

A duplicate of this transmittal is attached.

NOTE: Fees should be itemized in such a manner that it is clear for which purpose the fees are paid. 37 C.F.R. § 1.22(b).

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15. Authorization to Charge Additional Fees

WARNING: If no fees are to be paid on filing, the following items should not be completed.

WARNING: Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges, if extra claim charges are authorized.

- ☒ The Commissioner is hereby authorized to charge the following additional fees by this paper and during the entire pendency of this application to Account No. 23-0442.

☒ 37 C.F.R. § 1.16(a), (f) or (g) (filing fees)

☒ 37 C.F.R. § 1.16(b), (c) and (d) (presentation of extra claims)

NOTE: Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 C.F.R. § 1.16(d)), it might be best not to authorize the PTO to charge additional claim fees, except possibly when dealing with amendments after final action.

☐ 37 C.F.R. § 1.16(e) (surcharge for filing the basic filing fee and/or declaration on a date later than the filing date of the application)

☐ 37 C.F.R. § 1.17(a)(1)–(5) (extension fees pursuant to § 1.136(a)).

☐ 37 C.F.R. § 1.17 (application processing fees)

NOTE: “. . . A written request may be submitted in an application that is an authorization to treat any concurrent or future reply, requiring a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. An authorization to charge all required fees, fees under § 1.17, or all required extension of time fees will be treated as a constructive petition for an extension of time in any concurrent or future reply requiring a petition for an extension of time under this paragraph for its timely submission. Submission of the fee set forth in § 1.17(a) will also be treated as a constructive petition for an extension of time in any concurrent reply requiring a petition for an extension of time under this paragraph for its timely submission.” 37 C.F.R. § 1.136(a)(3).

☐ 37 C.F.R. § 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 C.F.R. § 1.311(b))

NOTE: Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of a Notice of Allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance. 37 C.F.R. § 1.311(b).

NOTE: 37 C.F.R. § 1.28(b) requires “Notification of any change in status resulting in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying, . . . the issue fee. . . .” From the wording of 37 C.F.R. § 1.28(b), (a) notification of change of status must be made even if the fee is paid as “other than a small entity” and (b) no notification is required if the change is to another small entity.

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16. Instructions as to Overpayment

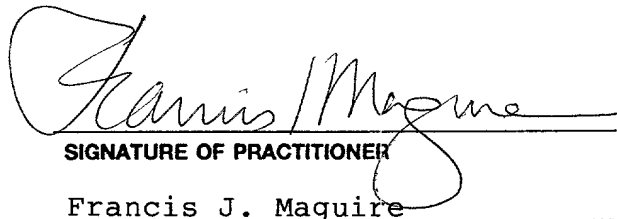
NOTE: "... Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five dollars may be returned by check or, if requested, by credit to a deposit account." 37 C.F.R. § 1.26(a).

- ☒ Credit Account No. 23-0442
☐ Refund

Reg. No. 31,391

Tel. No. (203) 261-1234

Customer No. 004955



SIGNATURE OF PRACTITIONER

Francis J. Maguire

(type or print name of attorney)

WARE, FRESSOLA, VAN DER SLUYS & ADOLPHSON L
P.O. Address

755 Main Street, PO Box 224

Monroe Ct 06468

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☒ **Incorporation by reference of added pages**

(check the following item if the application in this transmittal claims the benefit of prior U.S. application(s) (including an international application entering the U.S. stage as a continuation, divisional or C-I-P application) and complete and attach the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED)

- ☒ Plus Added Pages for New Application Transmittal Where Benefit of Prior U.S. Application(s) Claimed

Number of pages added 5

- ☐ Plus Added Pages for Papers Referred to in Item 4 Above

Number of pages added _____

- ☐ Plus added pages deleting names of inventor(s) named in prior application(s) who is/are no longer inventor(s) of the subject matter claimed in this application.

Number of pages added _____

- ☐ Plus "Assignment Cover Letter Accompanying New Application"

Number of pages added _____

☐ **Statement Where No Further Pages Added**

(if no further pages form a part of this Transmittal, then end this Transmittal with this page and check the following item)

- ☐ This transmittal ends with this page.

Practitioner's Docket No. 313-011-1

PATENT

**ADDED PAGES FOR APPLICATION TRANSMITTAL WHERE BENEFIT OF
PRIOR U.S. APPLICATION(S) CLAIMED**

NOTE: See 37 C.F.R. § 1.78.

17. Relate Back

WARNING: If an application claims the benefit of the filing date of an earlier filed application under 35 U.S.C. §§ 120, 121 or 365(c), the 20-year term of that application will be based upon the filing date of the earliest U.S. application that the application makes reference to under 35 U.S.C. §§ 120, 121 or 365(c). (35 U.S.C. § 154(a)(2) does not take into account, for the determination of the patent term, any application on which priority is claimed under 35 U.S.C. §§ 119, 365(a) or 365(b).) For a c-i-p application, applicant should review whether any claim in the patent that will issue is supported by an earlier application and, if not, the applicant should consider canceling the reference to the earlier filed application. The term of a patent is not based on a claim-by-claim approach. See Notice of April 14, 1995, 60 Fed. Reg. 20,195, at 20,205.

(complete the following, if applicable)

☒ Amend the specification by inserting, before the first line, the following sentence:

A. 35 U.S.C. § 119(e)

NOTE: "Any nonprovisional application claiming the benefit of one or more prior filed copending provisional applications must contain or be amended to contain in the first sentence of the specification following the title a reference to each such prior provisional application, identifying it as a provisional application, and including the provisional application number (consisting of series code and serial number)." 37 C.F.R. § 1.78(a)(4).

☒ "This application claims the benefit of U.S. Provisional Application(s) No(s).:

APPLICATION NO(S):

FILING DATE

60 / 124,642

March 16, 1999

_____ / _____

_____ "

_____ / _____

_____ "

B. 35 U.S.C. §§ 120, 121 and 365(c)

NOTE: "Except for a continued prosecution application filed under § 1.53(d), any nonprovisional application claiming the benefit of one or more prior filed copending nonprovisional applications or international applications designating the United States of America must contain or be amended to contain in the first sentence of the specification following the title a reference to each such prior application, identifying it by application number (consisting of the series code and serial number) or international application number and international filing date and indicating the relationship of the applications. . . . Cross-references to other related applications may be made when appropriate." (See § 1.14(a)). 37 C.F.R. § 1.78(a)(2).

- ☐ "This application is a
- ☐ continuation
 - ☐ continuation-in-part
 - ☐ divisional

of copending application(s)

- ☐ application number 0 / _____ filed on _____ "
- ☐ International Application _____ filed on _____
_____ and which designated the U.S."

NOTE: The proper reference to a prior filed PCT application that entered the U.S. national phase is the U.S. serial number and the filing date of the PCT application that designated the U.S.

NOTE: (1) Where the application being transmitted adds subject matter to the International Application, then the filing can be as a continuation-in-part or (2) if it is desired to do so for other reasons then the filing can be as a continuation.

NOTE: The deadline for entering the national phase in the U.S. for an international application was clarified in the Notice of April 28, 1987 (1079 O.G. 32 to 46) as follows:

"The Patent and Trademark Office considers the International application to be pending until the 22nd month from the priority date if the United States has been designated and no Demand for International Preliminary Examination has been filed prior to the expiration of the 19th month from the priority date and until the 32nd month from the priority date if a Demand for International Preliminary Examination which elected the United States of America has been filed prior to the expiration of the 19th month from the priority date, provided that a copy of the international application has been communicated to the Patent and Trademark Office within the 20 or 30 month period respectively. If a copy of the international application has not been communicated to the Patent and Trademark Office within the 20 or 30 month period respectively, the international application becomes abandoned as to the United States 20 or 30 months from the priority date respectively. These periods have been placed in the rules as paragraph (h) of § 1.494 and paragraph (i) of § 1.495. A continuing application under 35 U.S.C. 365(c) and 120 may be filed anytime during the pendency of the international application."

- ☐ "The nonprovisional application designated above, namely application _____ / _____, filed _____, claims the benefit of U.S. Provisional Application(s) No(s).:

APPLICATION NO(S).:

FILING DATE

_____ / _____	_____ "
_____ / _____	_____ "
_____ / _____	_____ "

- ☐ Where more than one reference is made above, please combine all references into one sentence.

18. Relate Back—35 U.S.C. § 119 Priority Claim for Prior Application

The prior U.S. application(s), including any prior International Application designating the U.S., identified above in item 17B, in turn itself claim(s) foreign priority(ies) as follows:

Country	Appln. no.	Filed on
---------	------------	----------

The certified copy(ies) has (have)

- ☐ been filed on _____, in prior application 0 / _____, which was filed on _____.
- ☐ is (are) attached.

WARNING: The certified copy of the priority application that may have been communicated to the PTO by the International Bureau may **not** be relied on without any need to file a certified copy of the priority application **in the continuing application**. This is so because the certified copy of the priority application communicated by the International Bureau is placed in a folder and is not assigned a U.S. serial number unless the national stage is entered. Such folders are disposed of if the national stage is not entered. Therefore, such certified copies may not be available if needed later in the prosecution of a continuing application. An alternative would be to physically remove the priority documents from the folders and transfer them to the continuing application. The resources required to request transfer, retrieve the folders, make suitable record notations, transfer the certified copies, enter and make a record of such copies in the Continuing Application are substantial. Accordingly, the priority documents in folders of international applications that have not entered the national stage may not be relied on. Notice of April 28, 1987 (1079 O.G. 32 to 46).

19. Maintenance of Copendency of Prior Application

NOTE: The PTO finds it useful if a copy of the petition filed in the prior application extending the term for response is filed with the papers constituting the filing of the continuation application. Notice of November 5, 1985 (1060 O.G. 27).

A. ☐ Extension of time in prior application

(This item must be completed and the papers filed in the prior application, if the period set in the prior application has run.)

- ☐ A petition, fee and response extends the term in the pending prior application until _____.
- ☐ A copy of the petition filed in prior application is attached.

B. ☐ Conditional Petition for Extension of Time in Prior Application

(complete this item, if previous item not applicable)

- ☐ A conditional petition for extension of time is being filed in the pending prior application.
- ☐ A copy of the conditional petition filed in the prior application is attached.

20. Further Inventorship Statement Where Benefit of Prior Application(s) Claimed

(complete applicable item (a), (b) and/or (c) below)

- (a) ☒ This application discloses and claims only subject matter disclosed in the prior application whose particulars are set out above and the inventor(s) in this application are
- ☒ the same.
- ☐ less than those named in the prior application. It is requested that the following inventor(s) identified for the prior application be deleted:

(type name(s) of inventor(s) to be deleted)

- (b) ☐ This application discloses and claims additional disclosure by amendment and a new declaration or oath is being filed. With respect to the prior application, the inventor(s) in this application are
- ☐ the same.
- ☐ the following additional inventor(s) have been added:

(type name(s) of inventor(s) to be added)

- (c) The inventorship for all the claims in this application are
- ☐ the same.
- ☐ not the same. An explanation, including the ownership of the various claims at the time the last claimed invention was made
- ☐ is submitted.
- ☐ will be submitted.

21. Abandonment of Prior Application (if applicable)

- ☒ Please abandon the prior application at a time while the prior application is pending, or when the petition for extension of time or to revive in that application is granted, and when this application is granted a filing date, so as to make this application copending with said prior application.

NOTE: According to the Notice of May 13, 1983 (103, TMOG 6-7), the filing of a continuation or continuation-in-part application is a proper response with respect to a petition for extension of time or a petition to revive and should include the express abandonment of the prior application conditioned upon the granting of the petition and the granting of a filing date to the continuing application.

22. Petition for Suspension of Prosecution for the Time Necessary to File an Amendment

WARNING: "The claims of a new application may be finally rejected in the first Office action in those situations where (A) the new application is a continuing application of, or a substitute for, an earlier application, and (B) all the claims of the new application (1) are drawn to the same invention claimed in the earlier application, and (2) would have been properly finally rejected on the grounds of art of record in the next Office action if they had been entered in the earlier application." M.P.E.P., § 706.07(b), 7th ed.

NOTE: Where it is possible that the claims on file will give rise to a first action final for this continuation application and for some reason an amendment cannot be filed promptly (e.g., experimental data is being gathered) it may be desirable to file a petition for suspension of prosecution for the time necessary.

(check the next item, if applicable)

- ☐ There is provided herewith a Petition To Suspend Prosecution for the Time Necessary to File An Amendment (New Application Filed Concurrently)

23. Small Entity (37 C.F.R. § 1.28(a))

- ☐ Applicant has established small entity status by the filing of a statement in parent application / _____ on _____ .
- ☐ A copy of the statement previously filed is included.

WARNING: See 37 C.F.R. § 1.28(a).

WARNING: "Small entity status must not be established when the person or persons signing the . . . statement can *unequivocally* make the required self-certification." M.P.E.P., § 509.03, 7th ed. (emphasis added).

24. NOTIFICATION IN PARENT APPLICATION OF THIS FILING

- ☐ A notification of the filing of this
(check one of the following)
- ☐ continuation
 - ☐ continuation-in-part
 - ☐ divisional

is being filed in the parent application, from which this application claims priority under 35 U.S.C. § 120.

Practitioner's Docket No. 313-011-1

PATENT

☒ Applicant Francis J. Maguire, ☐ Patentee _____

☐ Application No. _____ ☐ Patent No. _____

☐ Filed on _____ ☐ Issued on _____

Title: Moveable Headrest for Viewing Images from Different Directions

**STATEMENT CLAIMING SMALL ENTITY STATUS
(37 CFR 1.9(f) and 1.27(b))—INDEPENDENT INVENTOR**

As a below named inventor, I hereby state that I qualify as an independent inventor, as defined in 37 CFR 1.9(c), for purposes of paying reduced fees to the United States Patent and Trademark Office under Sections 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office, with regard to the invention described in

☒ the specification filed herewith, with title as listed above.

☐ the application identified above.

☐ the patent identified above.

I have not assigned, granted, conveyed or licensed, and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who would not qualify as an independent inventor under 37 CFR 1.9(c), if that person had made the invention, or to any concern that would not qualify as a small business concern under 37 CFR 1.9(d), or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

☒ No such person, concern, or organization exists.

☐ Each such person, concern or organization is listed below. *

*NOTE: Separate statements are required from each named person, concern or organization having rights to the invention as to their status as small entities. (37 CFR 1.27)

FULL NAME _____

ADDRESS _____

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

FULL NAME _____

ADDRESS _____

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

FULL NAME _____

ADDRESS _____

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

(Small Entity—Independent Inventor [7-1]—page 1 of 2)

Exp. Mail No. EL 381226795 US

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

(check the following item, if desired)

NOTE: The following verification statement need not be made in accordance with the rules published on Oct. 10, 1997, 62 Fed. Reg. 52131, effective Dec. 1, 1997.

NOTE: "The presentation to the Office (whether by signing, filing, submitting, or later advocating) of any paper by a party, whether a practitioner or non-practitioner, constitutes a certification under § 10.18(b) of this chapter. Violations of § 10.18(b)(2) of this chapter by a party, whether a practitioner or non-practitioner, may result in the imposition of sanctions under § 10.18(c) of this chapter. Any practitioner violating § 10.18(b) may also be subject to disciplinary action. See §§ 10.18(d) and 10.23(c)(15)." 37 C.F.R. § 1.4(d)(2).

☒ I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Francis J. Maguire, Jr.

Name of inventor

Francis J. Maguire
Signature of Inventor

Date March 13, 2000

Name of inventor

Signature of Inventor

Date _____

Name of inventor

Signature of Inventor

Date _____

U.S. Patent Application of
FRANCIS J. MAGUIRE, JR.

relating to a
MOVEABLE HEADREST FOR VIEWING IMAGES
FROM DIFFERENT DIRECTIONS

Exp. Mail No. EL 371226795 US

MOVEABLE HEADREST FOR VIEWING IMAGES
FROM DIFFERENT DIRECTIONS

BACKGROUND OF THE INVENTION

Technical Field

5 The present invention relates to imaging systems and, more particularly, to imaging systems in which a changing direction-of-view of the images is coupled to a changing direction-of-view of the head of the viewer.

Description of Related Art

10 Certain imaging systems provide the user with a light stimulus in the form of images (or for forming images) and provide other sensory stimuli as well to immerse the user in an artificial world that seems real. In active systems, movements of the user are sensed and used as inputs to a "virtual reality" engine that selects and provides the images and other sensory stimuli according to the sensed movements. In particular, the position and attitude of the head of the viewer can be monitored in three-dimensional space by several different methods. By "position" of the head is meant the translations in a three-dimensional space of the monitored head or of an arbitrary point associated therewith. By "attitude" of the head is meant the direction or direction-of-view of the monitored head or the arbitrary point. Its meaning is analogous to "attitude" in an aircraft, i.e., pitch, roll and yaw. Among these monitoring methods are: (a) the method and apparatus shown in US Patent No. 5,615,132 for determining position and orientation of a moveable object using accelerometers, (b) the image display method and apparatus with means for yoking viewpoint orienting muscles of a user shown in US Patent No. 5,436,638, and (c) optical methods such as shown in US Pat. No. 5,835,224 or US Pat. No. 5,729,475. Sensed signals

indicative of the position and attitude of the head are input to the reality engine which then generates images having a positional point-of-view as well as a direction-of-view that changes in correspondence with changes in the position and direction-of-view of the head of the user. In passive systems, such as shown in US Patent No. 5,734,421, the head of a passive user is guided in plural degrees of freedom by an actuator to view an artificial world from various positions and directions-of-view. However, these various approaches suffer from a twofold problem. First, the known active and passive systems require the user to address the imaging system with an erect standing or seated posture that can be physically wearying over extended periods. Second, in the context of active applications, such as entertainment, they require the user to exert a degree of activism that can be overly demanding and even disconcerting. Such requirements are the antithesis of the relaxed entertainment experience preferred by most users.

DISCLOSURE OF INVENTION

An object of the present invention is to provide an immersive imaging system that can be enjoyed passively or semi-actively, in a relaxed way, without requiring any overly demanding or disconcerting activism.

Another object of the invention is to provide an immersive imaging system without requiring a posture that wearies the user.

According to the present invention, an apparatus comprises a support for supporting a user in viewing images in a standing, seated, or reclining posture, and a moveable headrest mounted on or with respect to said support for supporting a head of said user in executing head movements with a changing direction.

In further accord with the present invention, the apparatus further comprises a display mounted on said head or on said moveable headrest for providing said images for said viewing from said changing direction.

5 In still further accord with the present invention, the apparatus further comprises an actuator for moving said moveable headrest. Or, the apparatus further comprises a sensor for sensing movements of said moveable headrest, i.e., for sensing said movements from a
10 changing direction. The apparatus may include both said actuator and said sensor.

These and other objects, features and advantages of the present invention will become more apparent in light of the detailed description of a best mode embodiment thereof as illustrated in the accompanying drawing.
15

BRIEF DESCRIPTION OF THE DRAWING

Fig. 1 shows a moveable headrest for supporting the head of a user in executing head movements while viewing images from a changing direction, according to the
20 invention.

Fig. 2 shows a user reclining on a support in the form of a recliner equipped with a moveable headrest while viewing images from a changing direction, according to the invention.

25 Fig. 3 shows a user standing on a support in the form of a human activity simulator equipped with a moveable headrest while viewing images from a changing direction, according to the invention.

Fig. 4 shows a user seated on a support in the form of a chair equipped with a moveable headrest while
30 viewing images from a changing direction, according to the invention.

Fig. 5 shows a moveable headrest with a pivotal support assembly for supporting the head of a user in

executing head movements while viewing images from a changing direction.

Fig. 6A shows the head of the user of Fig. 5 from above as the user views a scene with a straight-ahead direction-of-view.

Fig. 6B shows the head of the user of Fig. 5 from above as the user views a scene with a leftward direction-of-view.

Fig. 6C shows the head of the user of Fig. 5 from above as the user views a scene with a rightward direction-of-view.

Fig. 7 shows an open-loop proportional control for a moveable headrest used passively.

Fig. 8 shows a closed loop proportional-plus-integral control for a moveable headrest used passively.

Fig. 9 shows hardware setup for active use of the moveable headrest, i.e., with the user moving his head at will.

Fig. 10 is the same as Fig. 9 except that the reality engine 70b is remote and is accessed via a network 74b.

Fig. 11 shows passive use of the moveable headrest with an actuator 14c moving the headrest and hence the user's head in response to a signal on a line 16c from a local reality engine 70c.

Fig. 12 is the same as Fig. 11 except the reality engine is remote.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Fig. 1 shows a support 2 for supporting the body of a user and more particularly for supporting a moveable headrest 4 for supporting the back of the head 6 of the user in executing head movements while viewing images provided by a display 8 from a changing direction, i.e., a changing "direction-of-view," according to the

invention. In other words, the direction, i.e., attitude of the head of the viewer actively changes or is passively changed for viewing images from a correspondingly changing direction. In the case where the moveable headrest is moveable by the user actively changing the direction of his head, i.e., under his own volition, the movements are monitored by a sensor 10 for the purpose of providing an input signal on a line 12 to a reality engine (see Figs. 9 and 10) for selecting the images according to the changing direction. In the case where the attitude of the head of the user is passively changed, the moveable headrest is moveable by an actuator 14 to change the "direction-of-view" of the head of the user in response to a command signal on a line 16 from a reality engine (see Figs. 11 and 12) with the images changing their direction-of-view correspondingly, according to an image signal from the reality engine. Although the display 8 is shown adjacent the head 6, it should be realized that it can be apart from the head.

Fig. 2 shows a user 17 reclining on a support in the form of a recliner 2a equipped with a moveable headrest 4a with a rod 20 supported by a support 18 that is attached to or part of the support 2a. The support 18 may comprise brackets 22 through which the rod 20 is threaded. The rod may come to rest or be fixedly terminated on a stop 24. The head 6a of the user in a reclining position rests on the headrest 4a for viewing images from a changing direction-of-view provided by a display 8a which may be any kind of a display. One of the many types of display that may be used is a head mounted display such as shown in US Patent 5,671,037. Although the recliner 2a is shown as a stationary support, it can be of the type shown in US Patent No. 5,695,406. It should be realized that although the moveable headrest is shown supported by a support 2 which

may also support the body of the user, the body of the user need not be supported by the support 2 but may be supported in some other way. In other words, the moveable headrest may equivalently be supported by a support that is different from the support provided for supporting the body of the user. For instance, the headrest might be wall-mounted and the user support positioned nearby to allow the head of the supported user to rest on the headrest in the same way as shown above.

For another instance, Fig. 3 shows a user 17b secured in a standing position on a support 2b in the form of a human activity simulator such as shown in US Patent 5,792,031. The simulator is equipped, according to the present invention, with a moveable headrest 4b for supporting the head of the user while viewing images provided by a display 8b from a changing direction.

In yet another instance, Fig. 4 shows a user 17c seated on a support in the form of a chair 2c equipped with a moveable headrest 4c while viewing images provided by a display 8c from a changing direction, according to the invention. Although the chair 2c is shown as a stationary support, it can be of the type shown in US Patent No. 5,642,302, modified appropriately to be continuously positionable, as in the recliner of US Pat. No. 5,695,406.

Fig. 5 shows a moveable headrest 4d with a pivotal support assembly for supporting the head 6d of a user in executing head movements with a changing direction-of-view while viewing images from a correspondingly changing direction-of-view. Except for the display 8d, an actuator 26, a sensor 28 and a supporting bracket 30, the hardware for the headrest structure shown in Fig. 5 and described below is taken from US Patent No. 5,791,735 of Helman entitled "Headrest assembly with user actuated pivotal support assembly." The Helman headrest is for

attachment to a wheelchair seating system for use in supporting and assisting with movements of the head of a patient with weak neck muscles. It includes a cushioned backpad 32, a pair of laterally spaced apart cushioned side pads 34, and a mounting assembly 36 located substantially to the rear of said headrest. The mounting assembly 36 enables the backpad and the sidepads to rotate together as a unit about a vertical axis located forward of the mounting assembly. The mounting assembly is formed such that the vertical axis of rotation of the assembly substantially coincides with the spinal column of the human patient seated in the wheelchair. The rotational range of backpad 32 and sidepads 34 is manually adjustable and limited to a prescribed range. A force is formed with a rubber band 35 resisting rotational displacement in said backpad 32 and sidepads 34 returning said headrest to a null, forward facing orientation. The strength of the force increases with a corresponding increase in rotational displacement of the headrest. For the purposes of the present invention, the headrest assembly can be used to support the head of a user while viewing images from a controlled location.

To enable cushions 32, 34 to be positioned so that they best fit the particular user's head 6d, pivoting assemblies 38 connect the support cushions 32, 34 to structural members 40, 42, respectively. The pivoting assemblies 38 are composed off a ball and socket type joint which allows pivoting of cushions 32, 34. This pivoting action allows cushions 32, 34 to be tilted and oriented such that they best firmly contact the head of the particular user supported as shown e.g. in Figs. 2-4, thus accommodating different shapes and sizes of heads of different users. It should be realized that the left sidepad 34 is shown unpivoted in Fig. 5 in order to show the pivoting assembly. With a human head resting against

the sidepad 34 it will be tilted downward to engage the bottom of the skull of the head 6d as suggested by the dashed line 37. An additional pivoting assembly 44 connects extension member 40 to the mounting assembly 36. The mounting assembly 36 extends rearwardly of the backpad 32 and the sidepads 34 to a support mounting structure 46. Pivoting assembly 44 is composed of a ball and a socket type joint. Pivoting assembly 44 permits cushion 32 to be moved in a back and forth direction thus enabling even greater flexibility in positioning cushion 32 to the particular shape of the user's head. Side cushions 34 may also be adjusted in a back and forth direction since structural members 42 are received in a vice type bracket 48 which holds structural members 42 in place. Bolts 50 in brackets 48 can be loosened such that structural members 18 can be slid the slightly forward and backward, thus giving another dimension of movement in positioning cushions 34. After adjusting structural members 42 to the particular head shape of the user, bolts 50 are tightened in place fixing the side cushions 34 in position. Operating together, cushions 32 and 34 provide comfortable support to the rear and sides on the user's head. Balancing for the user's head is also provided by these supporting cushions.

The Helman headrest assembly provides support and balancing to the user's head not only when it is stationary, but also through limited degrees of motion. To accomplish this, the supporting cushions 32, 34 must be able to move with the rotation of the head. The mechanism to accomplish this function is found in the design of mounting assembly 36 which guides the motion of the cushions 32, 34. Mounting assembly 36 comprises a plurality of four forwardly extending arms 52, 54, 56, 58 which together comprise a linkage assembly. The movement of these forwardly extending arms with respect to one

another allows the user to have freedom to rotate his head to a limited degree. The method of functioning of the forwardly extending arms 52, 54, 56 and 58 is explained in more detail in the above-mentioned US Patent No. 5,791,735 of Helman which is hereby incorporated by reference. Suffice it to say that connectors 60, 62, 64 separate the various forwardly extending arms 52, 54, 56, 58 and enable these arms to pivotally rotate freely about the points through which the respective connector passes.

As mentioned above, the user is equipped with a display 8d, according to the present invention, which provides images from a changing direction-of-view in correspondence with a changing direction-of-view of the head 6d of the user. The user's head is supported and/or guided from the rear and the user can consequently assume a relaxed posture. The display need not be of the goggle type shown in Fig. 5, but may be of any type. Fig. 6A shows the user with his head 6d oriented in a straight-ahead looking direction for viewing a central rotunda part of the US Capital Building in silhouette with a certain field-of-view. In Fig. 6B, the field-of-view has been shifted left for viewing the left-hand side of the U.S. Capital Building. In Fig. 6C, the field-of-view has been shifted right for viewing the right-hand side of the U.S. Capital Building.

Depending on the design, the display can be used actively only, passively only, or in a dual mode version either actively or passively. Fig. 5 shows a design in which the headrest assembly of Helman can be used either actively or passively. This is accomplished by providing both a motor 26 and a sensor 28 on the bracket 30 which is rigidly attached to the mounting structure 46. The shaft of the motor and sensor may be axially coupled and fixed to the arm 54 for rotating the arm 54 about the common axis of the motor and sensor. This causes

rotations of the other arms 52, 56, 58, which are shown in more detail in US 5,791,735 of Helman. The motor 26 may be a stepping motor, a servo motor, or the like, for use in a passive mode of operation to actuate the headrest assembly in executing headrest movements such as illustrated in Figs 6A-6C for guiding the head 6d of the user. In that case, the sensed output signal from the sensor 26 may be unutilized (open loop control) or may be used as a feedback signal (closed loop control). An open loop control is shown in Fig. 7 with the command signal on the line 16 provided to a simple proportional amplifier that in turn provides an amplified output signal on a line 16a to the actuator 14. On other hand, the sensor 28 may be used in an active mode of operation to sense movements of the headrest assembly such as illustrated in Figs 6-8 as actuated by the volitional movements of the user's head 6d. The sensor may be an RVDT or rotary potentiometer, for instance, for sensing angular displacement. A closed loop control is shown in Fig. 8 with the command signal on the line 16 provided to a summing junction where the sensed signal on the line 12 is subtracted therefrom. A difference signal is provided by the summer to a compensator such as a proportional-integral (P-I) compensator that in turn provides a compensated output signal on a line 16b to the actuator 14.

Fig. 9 shows hardware setup for active use of the moveable headrest, i.e., with the user moving his head at will. A sensor 10a provides a sensed signal on a line 12a to a local reality engine 70a which, in response thereto, retrieves an image sequence from a memory therein having a plurality of such stored sequences. The signal on the line 12a is comparable to the signal on the line 28 of Fig. 3 of U.S. Patent 5,644,324. The retrieved sequence is provided on a line 72a to a display

8a for viewing by the active user. The reality engine 8a may be embodied in a local computer or a remote computer accessible through a network 74b, as shown in Fig. 10. In the example of Fig. 9, the active user moves his head and the headrest follows. The sensor 10a senses the angular rotation of the headrest and provides the sensed signal on the line 12a to the reality engine 70a which in turn provides the retrieved sequence on the line 72a to the display 8a. The retrieved sequence of images are taken from different directions of view, corresponding to the viewer's active head movements. The images are presented from differing directions of view according to the active user's head movements to make him feel that he is moving his head and viewing the virtual world in the same way he views the real world. Fig. 10 is the same as Fig. 9 except that the reality engine 70b is remote and is accessed via a network 74b. The reference numerals are similar to those of Fig. 9 except with the "b" suffix.

Fig. 11 shows passive use of the moveable headrest with an actuator 14c moving the headrest and hence the user's head in response to a signal on a line 16c from a local reality engine 70c. The signal on the line 16c is comparable to the signal on the line 20 of Fig. 1 of U.S. Patent 5,734,421. The sensor 10c provides the sensed signal on the line 12c to the local reality engine 70c as a feedback signal, for closed loop control. For a headrest that is only to be used for passive users, it should be realized that a sensor is not absolutely necessary since open loop control of the headrest will work. In the case of passive use, the reality engine retrieves a single, preplanned image sequence from a memory therein, in response to a start command signal on a line 76c. The start command signal on the line 76c can originate with the passive viewer pressing a button,

voicing a speech command, having his eyes monitored, by
some combination of such commands, or the like. The
retrieved sequence is provided on a line 72c to a display
8c for viewing by the passive user. The reality engine
5 70c may be embodied in a local computer or a remote
computer accessible through the network 74d, as shown in
Fig. 12. Fig. 12 is the same as Fig. 11 except the
reality engine is remote and accessed via a network 74d.
The reference numerals in Fig. 12 are similar to those of
10 Fig. 11 except having the suffix "d".

Although the invention has been shown and described
with respect to particular embodiments thereof, various
other changes, omissions, and additions in the form and
detail thereof may be made therein without departing from
15 the spirit and scope of the invention.

I claim:

1. Apparatus, comprising:
a support for supporting a user in viewing
images in a standing, seated, or reclining posture; and
5 a moveable headrest mounted on or with respect
to said support for supporting a head of said user in
executing head movements from a changing direction.

2. The apparatus of claim 1, further comprising a
display for providing said images for said viewing from
said changing direction.
10

3. The apparatus of claim 1, further comprising an
actuator for moving said moveable headrest.

4. The apparatus of claim 2, further comprising an
actuator for moving said moveable headrest.

5. The apparatus of claim 4, further comprising a
sensor for sensing movements of said moveable headrest.
15

6. The apparatus of claim 1, further comprising a
sensor for sensing said movements from a changing
direction.

7. The apparatus of claim 1, wherein said support
is moveable by an actuator.
20

8. Apparatus, comprising:

a sensor coupled to a moveable headrest for supporting a user's head, responsive to head movements of the user, for providing a sensed signal having a magnitude indicative of differing directions-of-view corresponding to said head movements;

a reality engine, responsive to said sensed signal, for providing an image signal indicative of a sequence of images from differing directions-of-view selected according to said sensed signal and corresponding thereto; and

a display, responsive to said image signal, for providing said sequence of images for viewing by said user from said differing directions-of-view.

9. Apparatus, comprising:

a reality engine, responsive to a start command signal, for providing an image signal indicative of a sequence of images from differing directions-of-view and for providing an actuator command signal corresponding thereto;

a display, responsive to said image signal, for providing said sequence of images for viewing by said user from said differing directions-of-view; and

an actuator, responsive to said actuator command signal, for moving a headrest supporting a user's head with movements corresponding to said differing directions-of-view.

ABSTRACT OF THE DISCLOSURE

A moveable headrest is mounted on or with respect to a support for supporting a user in viewing images in a standing, seated, or reclining posture. The headrest is for supporting the head of the user in executing head movements with a changing direction-of-view. A display mounted with respect to the user's head provides the images. An actuator can be provided for moving the moveable headrest for a passive user. A sensor can be provided for sensing movements of the moveable headrest, i.e., for sensing said movements from a changing direction. The moveable headrest apparatus may include either or both the actuator and the sensor.

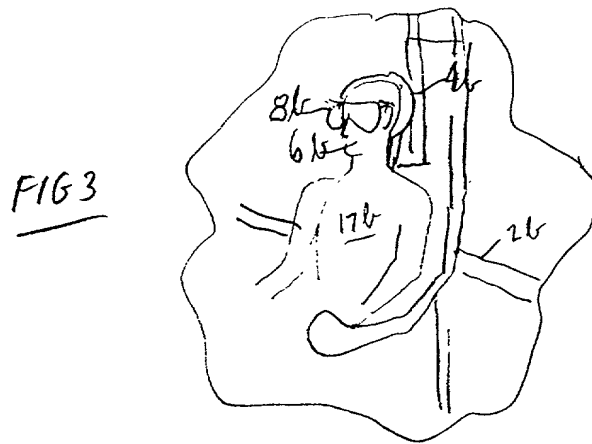
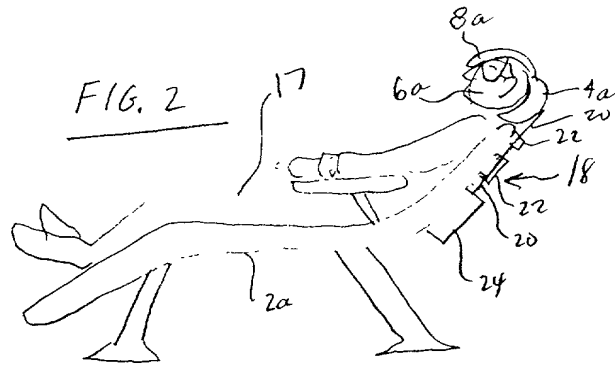
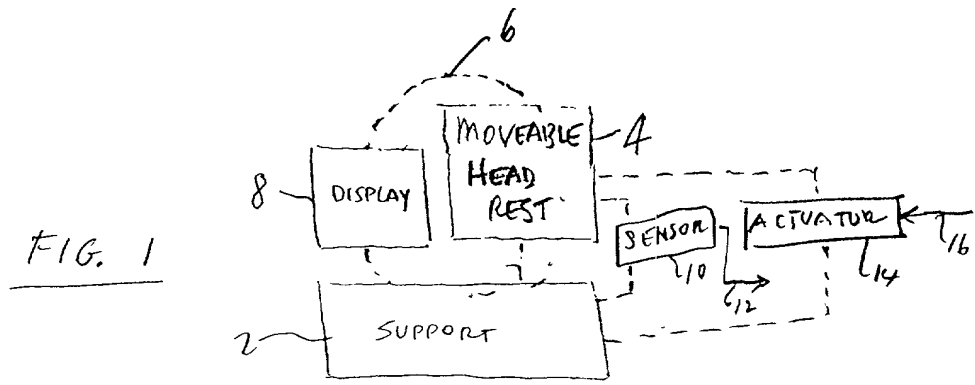


FIG 4

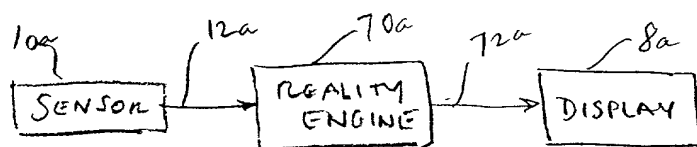
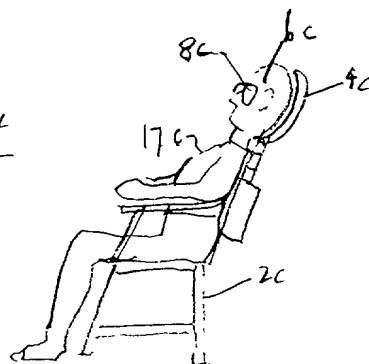


FIG 9

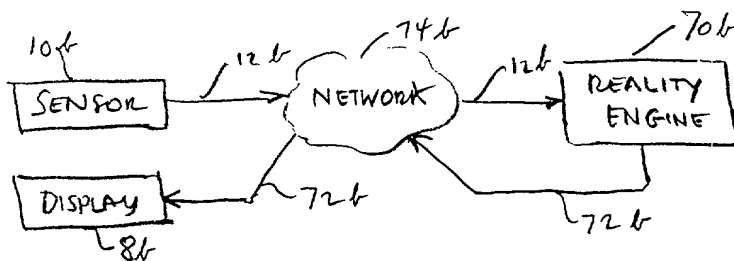


FIG 10

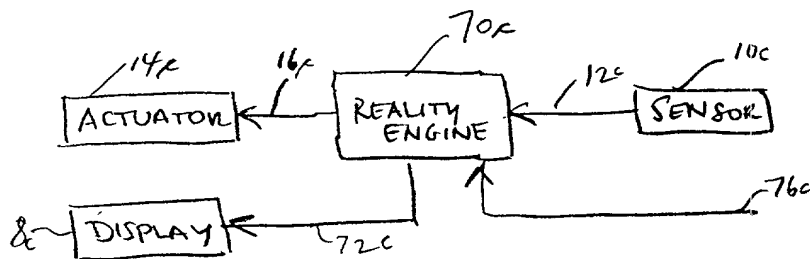


FIG 11

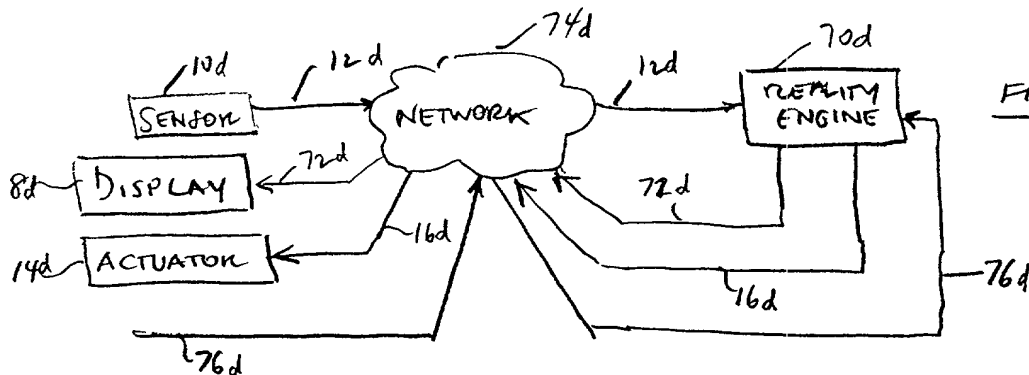


FIG 12

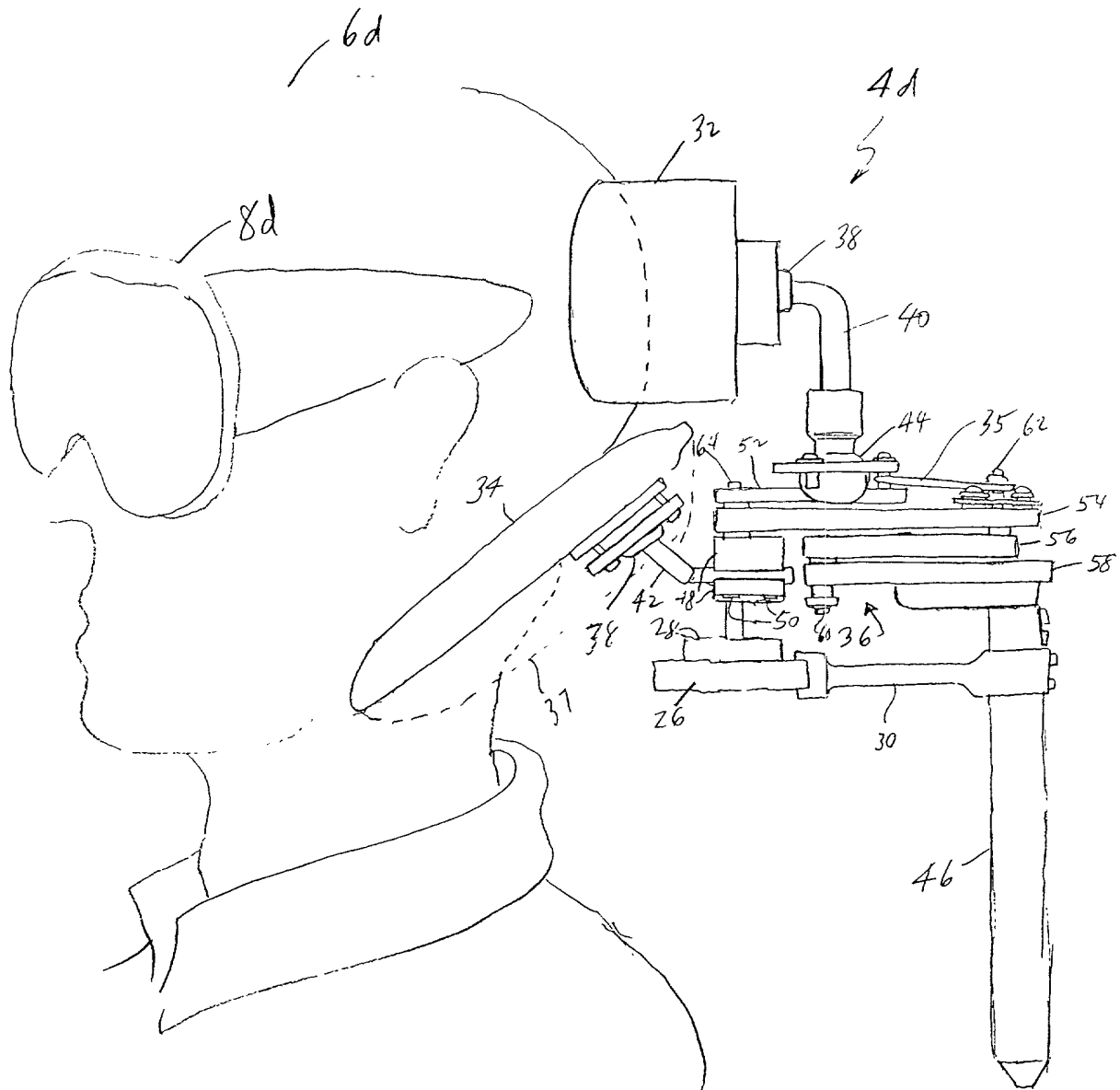


FIG 5

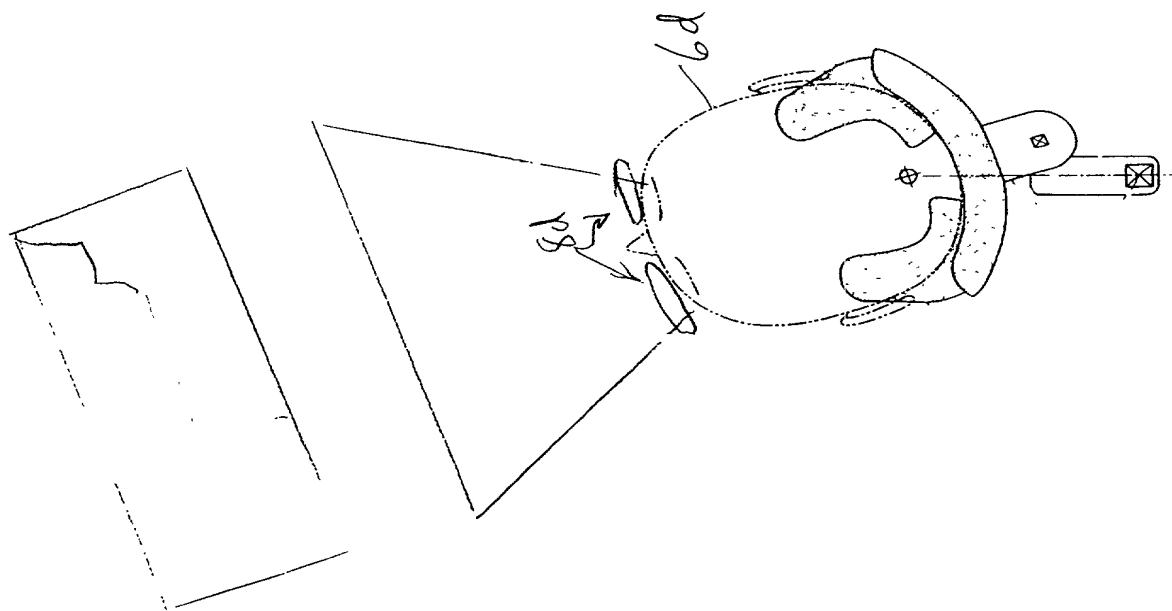


FIG. 6B

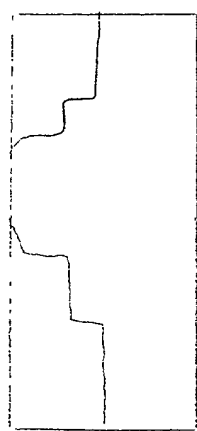


FIG. 6A

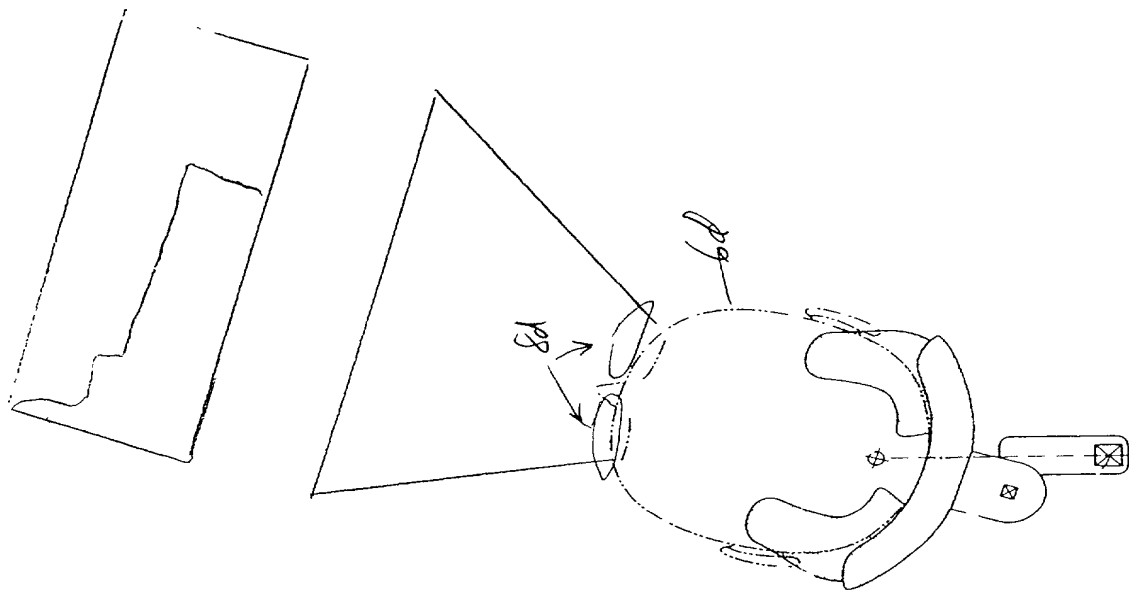


FIG. 6C

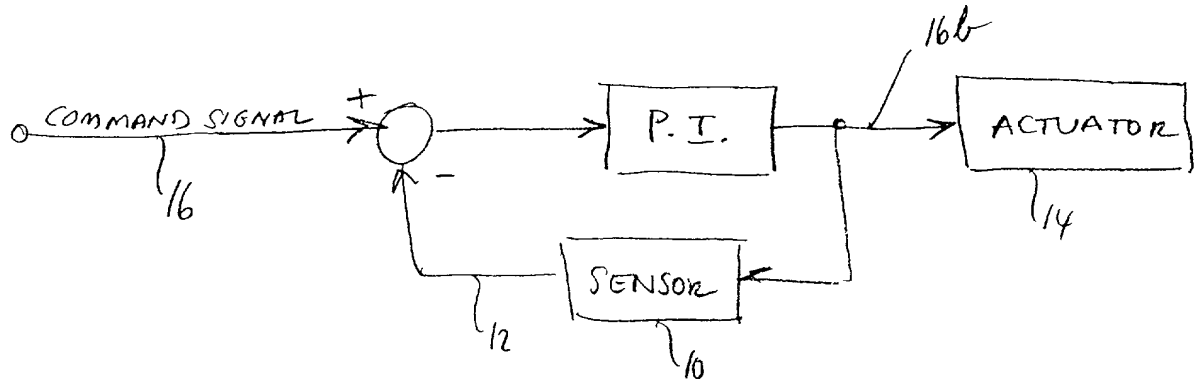


FIG. 8

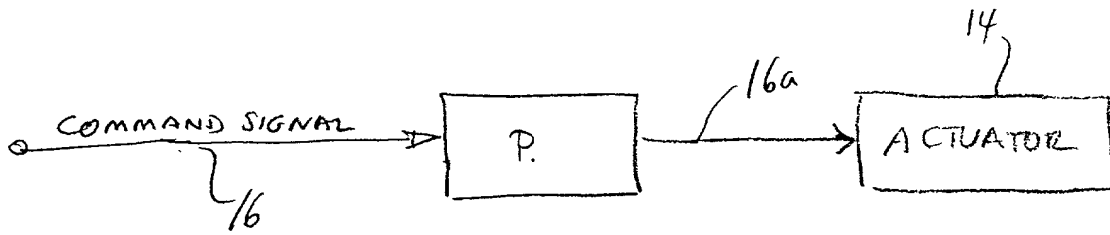


FIG. 7

COMBINED DECLARATION AND POWER OF ATTORNEYDocket Number: 313-011-1

As a below named inventor, I hereby declare that:

- my residence, post office address and citizenship are as stated below next to my name;
- I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: Moveable Headrest for Viewing Images from Different Directions.
- the specification of which is attached hereto unless the following box is checked: ☐; and
- that the application was filed on _____ as
U.S. Application Number _ _ _ _ _
or PCT International Application Number _ _ _ _ _
and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application			Priority Not Claimed
(Application Number) _____	(Country) _____	(Day/Month/Year Filed) _____	<input type="checkbox"/>
(Application Number) _____	(Country) _____	(Day/Month/Year Filed) _____	<input type="checkbox"/>

To the extent permitted by rule or law, I hereby incorporate by reference the Prior Foreign Application(s) listed above.

I hereby claim the benefits under 35 U.S.C. §119(e) of any United States provisional application(s) listed below:

<u>60/124,642</u> (Provisional Application Number)	<u>16/03/99</u> (Day/Month/Year Filed)
_____ (Provisional Application Number)	_____ (Day/Month/Year Filed)

I hereby claim the benefit under 35 U.S.C. §120 of any United States application(s), or §365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose information which is material to patentability, as defined in 37 CFR §1.56, which became available between the filing date of the prior application and the national or PCT International filing date of this application.

(Application Number) _____	(Day/Month/Year Filed) _____	(Status--patented, pending, abandoned) _____
(Application Number) _____	(Day/Month/Year Filed) _____	(Status--patented, pending, abandoned) _____

I hereby appoint Francis J. Maguire, Reg. No. 31391, and the attorney(s) and/or agent(s) assigned to his customer number listed below, as may from time to time be amended, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Customer Number

20413



020413

PATENT AND TRADEMARK OFFICE

Address all telephone calls to: Francis J. Maguire at (203) 261-1234. Address all correspondence to:

Customer Number

20413



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PATENT AND TRADEMARK OFFICE

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Residence	Citizenship
Post Office Address: _____	

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Inventor's Signature	Date
Residence	Citizenship